determining whether the sequence of digits is a valid existing credit card or telephone number; and

providing a dialogue manager with a verification measure of confidence for call confirmation, repair or disambiguation

REMARKS

Reconsideration and allowance of the claims in the application are requested.

Claims 1-10 are in the application. Claims 1, 5, 6, 7, 9 and 10 have been rejected under 35 USC § 102(e) as anticipated by USP 5970449 to F.A. Alleva et al. issued October 19, 1999 and filed April 3, 1997 (Alleva). Claims 2, 3, 4, 8 have been rejected under 35 USC § 103(a) as unpatentable over Alleva, of record, in view of USP 5970449 to X. Huang, et al. issued August 10, 1999, filed 1997 (Huang).

Applicants' attorney thanks the Examiner for the courtesy of a telephone interview conducted June 28, 2002. Applicants' attorney discussed the references and indicated that neither Alleva nor Huang disclosed a speech recognition processor that outputs a string of words that can include a numeric language comprising a set of digits relevant for interpreting and understanding a set of number strings. The Examiner indicated that the claims would be distinguishable from the cited art, if amended to recite a set of digits is interpreted for understanding a set of number strings.

Claims, 1, 5, 6, 9 and 10 have been amended to clarify the invention with respect to the cited art. Claims 11 and 12 have been added to obtain protection for the invention in more detailed form.

Before responding to the rejections, Applicants would like to distinguish Alleva and Huang from the present invention (Rahim), as follows:

1. Alleva discloses a computer system having a speech recognizer for recognizing portions of speech and speech input. The computer contains a computer readable medium holding instructions for performing and receiving text corresponding to the speech input from a speech recognition engine and applying a context free grammar to identify substitute content for the text. The substitute content is substituted in the text. Alleva fails to disclose elements of Rahim as follows:

A. Alleva discloses alphanumeric strings and applying a rule for a context free grammar to replace portions of the text with normalized alphanumeric strings. In contrast, Rahim discloses processing a string of words including a numeric language and converting the numeric language into a sequence of digits based upon a set of words or phrases relating to interpreting an understanding a set of number strings. There is no disclosure in Alleva relating to generating a sequence of digits from speech input.

B. Alleva discloses a text string including numerics and uses a text normalizer to determine whether there are any matching rules or not. See column 8, lines 1-14. In contrast, Rahim discloses an utterance processor that identifies out of vocabulary utterances and utterances that are poorly recognized in speech input. There is no disclosure in Alleva relating to separating utterances from a sequence of digits.

C. Alleva discloses a text buffer and a process buffer in which numerics are identified in the text and converted into digits and combined with the text, as shown in Fig. 9. In contrast, Rahim discloses a system for recognizing a string of digits based upon a numeric language. There is no disclosure in Alleva relating to generating a string of digits from a speech

input relating to credit cards and phone numbers.

D. Alleva discloses normalizing text utilizing a context free grammar. A tree representation is used in parts to input text from a speech recognizer. The text is processed and a text normalizer compares the text with rules contained within a tree and performs appropriate normalization. In contrast, Rahim discloses a validity database restoring valid credit cards and phone numbers, which are compared to a sequence of digits generated by a numeric understanding processor. A string processor validates the string of digits generating by the numeric understanding processor. There is no disclosure in Alleva relating to validating a string of digits against a database containing validity information relating to the sequence of digits.

Summarizing, Alleva fails to disclose a speech system that outputs a string of words that include a numeric language comprising a set of words or phrases relevant for interpreting and understanding a set of number strings. Alleva also fails to disclose a numeric understanding processor containing classes or rules for converting the string of words into a sequence of digits. Further, Alleva fails to disclose an utterance verification processor that identifies out of vocabulary utterances and utterances that are poorly recognized in speech input and provides verification to a dialog manager for call confirmation, repair or disambiguation. Without a disclosure in Alleva relating to the above described elements there is no support for the rejection of claims 1-10 under 37 CFR § 102(e).

2. Huang discloses a speech recognition system, which utilizes continuous density hidden Markov models to represent phonetic units of speech present and speech utterances. An acoustic score reflects the likelihood that a speech utterance matches a model linguistic expression. The matching is dependent on the output probability associated with the states of hidden Markov models. Context independent and context dependent continuous density hidden

Markov models are generated for each phonetic unit. An output probability associated with the state is determined by weighing the output probabilities of the context dependent and context independent states in accordance with the weighting factor. Huang fails to disclose elements of Rahim as follows:

A. Huang discloses two types of hidden Markov models, a context dependent HMM to model a phoneme, and a context independent HMM to model a phoneme in any context that appears in training data. In contrast, Rahim discloses a first set of HMMs that characterizes acoustic features of numeric words dedicated for the numeric language and a second set of HMMs that characterizes the features of the remaining vocabulary words. There is no disclosure in Huang relating to first and second sets of HMMs that characterizes acoustic features of numeric words and remaining vocabulary words.

B. Applicant can find no disclosure in Huang relating to Filler models to accommodate extraneous speech and background noise events in the speech signal, as described at page 8, lines 3-9.

Without a disclosure in Huang relating to HMMs pertaining to numeric words, remaining vocabulary words and extraneous speech and background noise that is no support for the rejection of claims 1-10 based upon the combination of Alleva in view of Huang. Neither Alleva nor Huang, alone or in combination, show or suggest a system for generating a sequence of digits representative of credit cards or phone numbers based upon numeric words and phrases and a numeric language where the numeric language consists of distinct phrase classes including digits, natural numbers, alphabets, restarts, city/country names and miscellaneous. Accordingly, Alleva or Huang, alone or in combination, do not provide a basis for a worker skilled in the art to implement the invention defined in claims 1-14. Withdrawal of the rejection of claims 1-14

under 35 USC § 103(a) is requested.

Now turning to the rejection, Applicant provides the following responses to the indicated paragraphs of the Office Action, as follows:

REGARDING PARAGRAPH 1:

Applicant notes the application as being examined under 35 USC § 102(e) prior to the American Inventors Protection Act of 1999.

REGARDING PARAGRAPH 2:

Claims 1, 5, 6, 7, 9 and 10 include elements not disclosed in Alleva, as follows:

(a) Claim 1:

(i) "... a speech recognition processor that ... outputs a string of words that can include a numeric language comprising a set of digits relevant for interpreting and understanding a set of numeric number strings;"

Contrary to the Examiner's statement, column 1, lines 56-62 does not describe a string of words that include a numeric language. The cited reference discloses alphanumeric strings which are not based upon a numeric language comprising a set of words or phrases relevant for interpreting and understanding a set of number string.

(ii) "... a numeric understanding processor containing classes or rules for converting the string of words into a sequence of digits."

Contrary to the Examiner's statement Fig. 9 and items 122 and 124 do not disclose a numeric understanding processor. Rather, Fig. 9 discloses a text string including words and numbers whereas Rahim discloses outputting a sequence of numbers without text as described in the specification at page 10, lines 7-24.

Accordingly, without a disclosure in Alleva relating to a speech recognition processor that outputs a string of words into a sequence of digits based upon a numeric language there is no basis for the rejection of claim 1 under 35 USC § 102(e). Withdrawal of the rejection of claim 1 and allowance thereof are requested.

(b) Claim 5:

(i) "... an utterance verification processor that identifies out of vocabulary utterances and utterances that are poorly recognized in unconstrained input speech."

Contrary to the Examiner's statement column 8, lines 1-14 do not describe an utterance verification processor. The cited text discloses a text normalizer for converting words into numbers and outputting text with the numbers substituted for words. There is no disclosure in Alleva relating to outputting utterances, which are out of vocabulary or are poorly recognized.

Without a disclosure in Alleva relating to an utterance processor identifying out of vocabulary utterances and poorly recognized utterances, there is no support for the rejection of claim 5 under 35 USC § 102(e). Withdrawal of the rejection of claim 5 and allowance thereof are requested.

(c) Claims 6 and 7:

(i) "... a validity database that stores a numeric grammar comprising rules relating to naturals, restarts, alphabets, city/country, numeric phrases and out of vocabulary classes; and.....outputting a sequence of digits with the numeric grammar."

Contrary to the Examiner, column 7, lines 10-28 does not describe a validation database. Column 7, lines 10-28 describes a context free grammar text file and performing normalization of the text. There is no disclosure in Alleva relating to a validity database for confirming the validity of number strings for credit cards and telephone numbers.

Without a disclosure of a validity database in Alleva, there is no support for rejection of claim 6 under 35 USC § 102(e). Withdrawal of the rejection of claim 6 is requested.

(ii) Claim 7 is patentable on the same basis as claim 6 from which it depends.

(d) Claim 9:

(i) "... the numeric understanding processor recognizing restart, city/country and miscellaneous."

There is no disclosure in Fig. 9 relating to recognizing restart, city/country, etc. Fig. 9 discloses a text normalizer recognizing digit rules and not different phrases in the string of words.

Without a disclosure in Alleva relating to recognizing certain phrases associated with and included in the string of words, there is no support for the rejection of claim 9 under 35 USC § 102(e). Withdrawal of the rejection of claim 9 and allowance thereof are requested.

(e) Claim 10:

(i) "... receiving unconstraining input speech as a string of words that can include a numeric language comprising a set of digits relevant for interpreting and understanding a set of number strings;"

Claim 10 is patentable on the same grounds as claim 1.

Withdrawal of the rejection of claim 10 under 35 USC § 102(e) based upon Alleva is requested.

REGARDING PARAGRAPH 3/4:

Applicant's attorney understands the subject matter of the various claims were commonly owned at the time of the invention as represented by the declarations and assignments of the

invention filed in the application.

REGARDING PARAGRAPH 5:

Claims 2, 3, 4 and 8 include elements not disclosed, taught or suggested in Alleva in view of Huang, as follows:

(a) Claim 2:

Claim 2 is patentable on the same basis as claim 1 from which it depends.

(b) Claims 3 and 4:

(i) "... a first set of hidden Markov models characterized in numeric language."

Contrary to the Examiner's statement, column 3, lines 46-54 do not describe hidden Markov models characterized in numeric language. The cited column describes a context dependent model for a phoneme and a context independent HMM to model a phoneme in any context that appears in training data. There is no disclosure in Huang or Alleva relating to an acoustic database that characterizes a numeric language comprising digits relating to understanding and interpreting the numeric language as described in the specification at page 6, lines 1-14.

Without a disclosure in Alleva or Huang, alone or in combination, relating to HMMs models that characterize a numeric language or remaining language in a vocabulary, there is no basis for a worker skilled in the art to implement claims 3 and 4. Withdrawal of the rejections of claims 3 and 4 and allowance thereof are requested.

(c) Claim 8:

(i) Claim 8 is patentable on the same basis as claim 1 from which it depends.

REGARDING PARAGRAPH 6:

Applicant has reviewed the cited and not applied art and concludes their disclosures are cumulative to the cited art.

PATENTABILITY SUPPORT FOR CLAIMS 11 AND 12

Claim 11 describes the significant features of claims 1-10, particularly determining whether the sequence of digits identified by the numeric language is a valid existing credit card or telephone numbers.

Applicant can find no disclosure in Alleva or Huang, alone or in combination, relating to verifying a sequence of digits in numeric language as a valid existing credit card or telephone numbers. Nor can Applicant find any disclosure in Alleva in view of Huang relating to an utterance processor providing a dialog manager with a verification measure of confidence for call confirmation repair or disambiguation.

Applicant submits that claim 11 is patentable on the same grounds as claims 1-10 plus the additional features of verifying the validity of the sequence of digits and providing a dialog manager with a verification measure of confidence for call confirmation repair or disambiguation.

Claim 12 describes claim 11 in method form and is patentable over Alleva in view of Huang on the same basis as claim 11.

Entry of claims 11 and 12 and allowance thereof are requested.

CONCLUSION:

Having amended the claims to clarify the invention with respect to the cited art, considered the cited but not applied art; supported the patentability of new claims 11 and 12, Applicant request entry of the amendment and allowance of claims 1-12 and passage to issue of the case.

AUTHORIZATIONS:

The Commissioner is hereby authorized to charge any fees or insufficient fees or credit any payment or overpayment associated with this application to Deposit Account No. 13-4503, Order. 2455-4602. A duplicate of this authorization is attached for the Finance Branch.

Respectfully submitted,
MORGAN & FINNEGAN, L.L.P.

Date: June 28, 2002 By: _____

Joseph C. Redmond
Registration No.: 18,753
(202) 857-7887 Telephone
(202) 857-7929 Facsimile

CORRESPONDENCE ADDRESS:
Morgan & Finnegan, L.L.P.
345 Park Avenue
New York, New York 10154

PATENT
Docket No. 2455-4602

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	M. RAHIM et al.	:		
Serial No.:	09/314,637	:	Art Unit:	2654
Filed:	May 19, 1999	:	Examiner:	Dorvil, R.

For: RECOGNIZING THE NUMERIC LANGUAGE IN NATURAL SPOKEN DIALOGUE

ATTACHMENT A – SHOWING MARKUP OF CHANGES

Commissioner of Patents
Washington, D.C. 20231

Sir:

IN THE CLAIMS:

The claims have been AMENDED as follows:

1. (Amended) A system, comprising:

a speech recognition processor that receives unconstrained input speech and outputs a string of words that can include a numeric language **comprising a set of digits relevant for interpreting and understanding a set of number strings**; and

a numeric understanding processor **containing classes of rules for converting [converts]** the string of words into a sequence of digits.

5. (Amended) The system of claim 1, further comprising:

an utterance verification processor **that identifies out-of –vocabulary utterances and utterances that are poorly recognized in unconstrained input speech [verifies the accuracy of the numeric language in the string of words]**.

6. (Amended) The system of claim 1, further comprising:

a validity database that stores a **numeric** grammar **comprising rules relating to turals, restarts, alphabets, city/country, numeric phrases and out-of-vocabulary classes**; and

a string validation processor that outputs validity information based on a comparison of e sequence of digits with the **numeric** grammar.

9. (Amended) The system of claim 1, wherein:

the numeric understanding processor **recognizing restart, city/country and iscellaneous phrases in the string of digits[converts the string of words into the sequence of digits based a set of rules]**.

10. (Amended) A method, comprising the steps of:

receiving unconstrained input speech **[and outputting]** as a string of words that can include a numeric language **comprising a set of digits relevant for interpreting an understanding a set of number strings**; and

converting the string of words into a sequence of digits.